Abstract for : "Research in Progress" session at the Spring 2002 ACI convention.

SITE TRIALS OF CONCRETE BARRIERS FOR LANDFILL LINERS.

Dr P A Claisse (corresponding), Coventry University
Professor A Atkinson, Imperial College
Dr E Ganjian, Coventry University
Dr M Tyrer, Imperial College

This paper reports current results from a major research programme into the use of concrete in the construction of barriers to contain leachate from waste in landfill. The barriers are of composite multi-layer construction with layers of concrete above and below a clay core. This work is being supported by the landfill industry in the UK and is intended to provide a financially attractive alternative to current technologies such as bentonite and high density polyethylene membranes.

The materials that have been used in the trials include:

Waste sodium sulphate solution
Ferrosilicate slags
Spent casting sands
Run of station and lagoon ash from power plants.
Spent borax
Chrome alumina slag
Cement kiln dust

These materials are all wastes and the majority of them attract landfill tax in addition to the high cost of disposal in a landfill site. The saving of disposal costs exceeds the cost of transport and mixing and they are therefore classified as *negative cost concretes.*

Three trial cells have been constructed using 20 m^3 (26 yd^3) of waste-derived concrete in each. The cells have been filled with waste and leachate and monitored for contamination at different levels for more than a year. Details of the mix designs, the construction process, and the results of the monitoring will be presented.

Address:

Dr P A Claisse
School of Science and the Environment
Coventry University
Coventry
CV1 5FB
UK

Phone	+44 24 7688 8881
Reception	+44 24 7688 8166
Fax	+44 24 7688 8296
EMAIL	p.claisse@coventry.ac.uk

:

Research in Progress
Spring 2002 ACI convention.

SITE TRIALS OF CONCRETE BARRIERS FOR LANDFILL LINERS.

Dr P A Claisse, Coventry University
Professor A Atkinson, Imperial College
Dr E Ganjian, Coventry University
Dr M Tyrer, Imperial College

Contents

- The barrier concept
- Laboratory work
- Cell construction

THE BARRIER CONCEPT

Existing systems – clay and HDPE
- Protection from damage
- Long term?

Physical and chemical barrier
- Concept from the nuclear industry
- High pH of concrete reduces solubility of metals

The multi-layer barrier
- Soft and hard layers
- Protection of clay layer
- Crack sealing in concrete

Negative cost concrete
- A product – not a waste

LABORATORY TESTING

Through flow tests at 14MPa applied pressure to measure permeability and chemical buffering (tests with water and artificial leachate)

Strength tests